

REMARKS

Claims 1 – 61 are in the instant application. No claims have been allowed. Claims 2, 3, 6, 16, 19 – 21, 23 – 26, 41, 44, 46, 49 and 59 - 61 are amended for the first time, and claims 1, 18, 22 and 58 are amended for the second time, to more positively recite applicants' patentably novel embodiments of their invention. Claims 1, 6, 16, 17, 18, 26, 41, 42, 45, 46, 49, 54 and 58 – 61 are independent claims. Claims 2 – 5 are dependent on claim 1; claims 7 – 15 are dependent on claim 6; claims 19 – 25 are dependent on claim 18; claims 27 – 40 are dependent on claim 26; claims 43 and 44 are dependent on claim 42; claims 47 and 48 are dependent on claim 46; claims 50 – 53 are dependent on claim 49, and claims 55 – 57 are dependent on claim 54.

Independent article claims 1, 6, 16 - 18, 26, 41, and 58 and independent method claims 59 and 60, and the claims dependent thereon are directed to, among other things, a breaker layer to prevent or reduce epitaxial growth between crystalline layers. Claims 49 - 53 are directed to, among other things, a coated article having a breaker layer and a color suppression layer. Claims 42 – 44 and claim 57 dependent on claim 54 are directed to a coating having, among other things, a color suppression layer. Article claims 45, 46 – 48, and 54 – 56 and method claim 61 are directed to, among other things, a coating.

Claims 1 – 41, and 58 - 60 directed to, among other things, a coating having a breaker layer are rejected under 35 U.S.C. 112, first and/or second paragraphs. Applicants respectfully traverse the rejection of claims 1 – 41 and 58 - 60 under 35 U.S.C. 112 first and/or second paragraphs; however to reduce the issues independent claims 1, 6, 16 - 18, 26, 41 and 59 - 60 and selected claims dependent thereon have been amended and now recite in one form or another first and second coating layers and a breaker layer having the following properties. Each of the coating layers has a first surface and an opposite surface defined as a second surface. The size of the crystals between the first and second surfaces increases in a direction from the first surface toward the second surface. The first surface of the second layer is in facing relationship to the second surface of the first layer. At least one breaker layer is between the second surface of the first layer and the first

surface of the second layer, and the breaker layer is configured to interrupt growth of crystal structure of the second layer. More particularly, the crystals of the second layer are inhibited from growing on the second surface of the first layer.

Support for the amendments to claims 1 - 3, 6, 16, 18 - 26, 41 and 59 - 60 is found, among other places, in the specification at page 14, line 20; - page 15, line 6. Based on the foregoing, applicants request admittance and consideration of claims 1 - 41, 59 and 60.

Applicants respectfully submit that amended claims 1, 6, 16 - 18, 26, 41 and 59 - 60 meet all the requirements of 35 U.S.C. 112, first and second paragraphs. More particularly, the claims define the structure of the coating layer or layers as those that have crystal growth from one surface to the opposite surface and that the breaker layer prevents a second coating layer from nucleating from the first coating layer (refer to page 10, lines 12 - 30, of the specification).

Based on the foregoing, applicants respectfully request withdrawal of the rejection of claims 1 - 41, 58 - 60 under 35 U.S.C. 112, first and second paragraphs, and request allowance thereof.

Claims 49 - 53 directed to, among other things, a coating having a breaker layer and a color suppression layer are rejected under 35 U.S.C. 112, first and second paragraphs. Applicants respectfully traverse the rejection of claims 49 - 53 under 35 U.S.C. 112, first and second paragraphs, however to reduce the issues claim 49 on which claims 50 - 53 are dependent has been amended to recite in one form or another first and second coating layers and a breaker layer having the following properties. Each of the coating layers has a first surface and an opposite surface defined as a second surface. The size of the crystals between the first and second layers increases in a direction from the first surface toward the second surface. The first surface of the second layer is in facing relationship to the second surface of the first layer. At least one breaker layer is between the second surface of the first layer and the first surface of the second. The breaker layer is configured to interrupt crystal structure of the coating. With this arrangement the crystals of the second layer are inhibited from growing on the second surface of the first layer.

Support for the amendments to claim 49 is found, among other places, in the specification at page 14, line 20, – page 15, line 6. Based on the foregoing, applicants request admittance of the amendment to claim 49 and consideration of claims 49 - 53.

Applicants respectfully submit that amended claim 49 meets all the requirements of 35 U.S.C. 112, first and second paragraphs. More particularly, the claim defines the structure of the coating layer or layers as those that have crystal growth from one surface to the opposite surface and that the breaker layer prevents a second coating layer from nucleating from the first coating layer (refer to page 10, lines 12 – 30, of the specification).

Based on the foregoing, applicants respectfully request withdrawal of the rejection of claims 49 – 53 under 35 U.S.C. 112, first and second paragraphs, and request allowance thereof.

Claims 42 – 44 directed to a coated article having, among other things, a gradient color suppressing layer and claim 61 directed to a method of depositing a coating layer having a color suppression layer are rejected under 35 U.S.C. 112, first and/or second paragraphs. Applicants respectfully traverse the rejection of claims 42 – 44 and 61 under 35 U.S.C. 112, first and/or second paragraphs, and request reconsideration thereof. Applicants respectfully submit that claims 42 and 61 set forth all the parameters, e.g. thickness and composition of the coatings. The suppression layer can be determined by viewing the coating with and without a layer. If the color is suppressed with the layer, it is a color suppression layer; if it does not, the coating is not a color suppression layer.

Based on the foregoing, applicants respectfully request withdrawal of the rejection of claims 42 – 44 and 61 under 35 U.S.C. 112, first and/or second paragraphs.

Claims 46 and 47 directed to a coated article are rejected under 35 U.S.C. 112, second paragraph. The Office Action alleges that the claims set forth a physical characteristic (refractive index) desired but fail to set forth specific compositions for the layers. The Office Action alleges that merely setting forth a physical characteristic desired in an article, and not setting forth specific compositions, which would meet such a characterized, are invalid as vague, indefinite, and functional since they cover any conceivable

combination of ingredients either presently existing or which might be discovered in the future and which would impart the undesired characteristic. Applicants respectfully traverse the rejection of claims 46 and 47 under 35 U.S.C. 112, second paragraph, however to reduce the issues claim 46, on which claim 47 is dependent, is amended.

Claim 46 in its amended form recite a coated article having, among other things a substrate; a first doped metal oxide layer deposited over at least a portion of the substrate, the first doped metal oxide having an index of refraction, and a second doped metal oxide layer deposited over the first doped metal oxide layer. The second doped layer has an index of refraction and the index of refraction of the first doped metal oxide layer is lower than the index of refraction of the second doped metal oxide layer. Support for the amendment to claim 46 is found, among other places, in the originally filed claims. Based on the foregoing, applicants respectfully request admittance and consideration of amended claim 46 and claim 47 dependent thereon.

Claim 46 defines a first doped metal oxide layer and a second doped metal oxide layer by their respective index of refraction. Materials that meet the criteria of claim 46 are (a) those metal oxides that are doped (b) have an index of refraction and (c) are arranged with the first layer having the lower index of refraction or the second layer having the higher index of refraction. Claim 47 dependent on claim 46 recites that the first layer includes antimony doped tin oxide. Applicants respectfully submit that claims 46 and 47 meet the requirements of 35 U.S.C. 112, second paragraph. Applicants note that claim 48 was not rejected under 35 U.S.C. 112, second paragraph. Applicants did not amend claim 48 to be in independent form because applicants believe the amendment to claim 46 overcomes the 35 U.S.C. 112, second paragraph, rejection. In the event, applicants deem necessary, claim 48 may be presented and submitted as an independent claim at a later date.

Based on the foregoing, applicants respectfully request withdrawal of the rejection of claim 46 and 47 under 35 U.S.C. 112, second paragraph.

Claims 46 – 48 and 54 – 56 are rejected under 35 U.S.C. 102(e) as being anticipated by McKown et al. U.S. Patent No. 6,218,018 (hereinafter also referred to as "McKown"). Applicants respectfully traverse the rejection

of claims 46 – 48 and 54 – 56 under 35 U.S.C. 102(e) as being anticipated by McKown and request reconsideration thereof. The Office Action alleges that McKown discloses numerous variations of depositing on a glass substrates of tin oxide with fluorine and a layer of tin oxide with antimony and refers applicant to the entire document. Applicants have reviewed McKown and have found no discussion regarding the index of refraction of the material. Further there is no discussion of applicants' patentably novel invention as set forth in claims 46 – 48 of depositing a first doped metal oxide layer on a substrate and depositing a second doped metal oxide layer over the first metal oxide doped layer wherein the first metal oxide doped layer has a lower refractive index than that of the second doped metal oxide layer. Since McKown fails to teach the combination of metal oxide layers recited in applicants' claims 46 – 48, McKown can not anticipate applicants' invention as set forth in claims 46 – 48.

Regarding claims 54 – 56, the Office Action alleges that McKown discloses that the coated article may comprise a substrate with a gradient layer deposited thereon comprising tin oxide doped with fluorine and antimony (column 7, lines 21 – 56, and Figure 3 of McKown). Applicants respectfully submit that there is no disclosure in McKown of their invention recited in claims 54 – 56. More particularly, there is no discussion of a metal oxide film on a substrate having a dopant, e.g. a first metal oxide having a first dopant and a metal oxide film having a different dopant than the first dopant spaced defined as a second metal oxide layer having a second dopant spaced from the first film and a gradient film between the first film and the second film and having the concretion of the first dopant decrease as the distance from the first film increases and the second dopant increase as the distance from the second film increases. This combination of films is not disclosed in McKown.

Based on the above, Applicants respectfully request withdrawal of the rejection of claims 46 – 48 and 54 – 56 under 35 U.S.C. 102(e) as being anticipated by McKown and request allowance thereof.

Claims 45 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKown. Applicants respectfully traverse the rejection of claims 45 and 57 under 35 U.S.C. 103(a) as being unpatentable over

McKown and requests reconsideration thereof. Claim 45 is an independent claim, and claim 57 is dependent on claim 54. Claim 54 and McKown were discussed above.

The Office Action alleges that it would have been obvious to one having ordinary skill in the art as the time the invention was made to adjust the thickness, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in art. Applicants submit that the foregoing can be accepted as correct if the reference identifies the characteristics to be obtained and the effect of the change to the components to obtain the characteristics. In applicants' claim 45 the thickness of the layers are selected to prevent iridescence without a suppression layer, e.g. see Predictive Example VI on page 36 of applicants' specification. McKown fails to teach that iridescence of the coated article can be prevented by having a two strata coating of antimony doped tin oxide and a fluorine doped tin oxide layer with the ranges and thickness values recited in claim 45. Since McKown fails to disclose that an iridescence layer can be suppressed, it cannot provide information for one having ordinary skill in the art from finding an optimum value.

Claim 57 is dependent on claim 54 and recites that a color suppression layer is located between the first region and the substrate. The argument put forth to patentably distinguish claim over McKown is incorporated herein. McKown was discussed above where it was shown that McKown failed to disclose the coated article of claim 54 and therefore cannot provide a basis for a rejection under 35 U.S.C. 103 (a). Therefore, the rejection of claim 57 is made in hindsight.

Based on the above, Applicants respectfully request withdrawal of the rejection of claims 45 and 57 under 35 U.S.C. 103(a) as being unpatentable over McKown and request allowance thereof.

This amendment represents a sincere effort to place the application in condition for allowance. In the event issues remain, the Examiner is invited to call the undersigned to discuss those issues before further action is taken on the case.

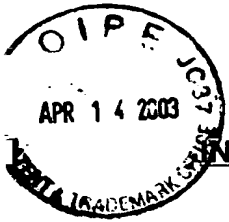
Attached hereto is a marked-up version of the amendments to the claims made by the instant amendment. The attached page is captioned ..
:
:
"Version with markings to show changes made".

Respectfully submitted,

DONALD C. LEPIANE
Registration No. 25,996
Attorney of Record


(412) 434-3186

Pittsburgh, Pennsylvania
April 8, 2003



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend claims 2, 3, 6, 16, 19 – 21, 23 – 26, 41, 44, 46, 49, and 59 - 61 for the first time and claims 1, 18, 22 and 58 for the second time as follows:

Claim 1. (Twice Amended) A coating over a portion of a surface of a substrate, the coating comprising:

a first coating [surface] layer having crystallinity, and a first surface and an opposite surface defined as a second surface of the first coating layer with crystal size within the first coating layer increasing in a direction from the first surface of the first coating layer toward the second surface of the first coating layer;

a second coating [surface] layer having crystallinity, and a first surface and an opposite surface defined as a second surface of the second coating layer with the first surface of the second layer in facing relationship to the second surface of the first layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer.[:] and

at least one breaker layer [located] between the second surface of the first layer and the first surface of the second [coating surfaces], the breaker layer configured to interrupt [a] growth of crystal structure [of the coating] of the second layer whereby the size of the crystals of the second layer are reduced as a result of inhibiting the growth of the crystals of the second layer on the second surface of the first layer.

2. (Amended) The coating according to claim 1, wherein [the first and second coating surfaces are substantially crystalline and] the breaker layer is substantially amorphous.

3. (Amended) The coating according to claim 1, wherein at least one of the first and second coating [surfaces] layers comprises at least one metal oxide and at least one dopant.

6. (Amended) A coating over a portion of a surface of a substrate, the coating, comprising:

a substantially crystalline first layer having a first surface and an opposite surface defined as a second surface of the first layer with crystal size within the first layer increasing in a direction from the first surface of the first layer toward the second surface of the first layer;

a substantially crystalline second layer deposited over the first layer, the second layer having a first surface and an opposite surface defined as a second surface of the second layer with the first surface of the second layer in facing relationship to the second surface of the first layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer, [;] and

a breaker layer [located] between the first and second layers, the breaker layer configured to prevent or at least reduce epitaxial growth of crystals at the first surface of the second layer on the crystals at the second surface of the first layer.

16. (Amended) A coating over a portion of a surface of a substrate, the coating, comprising:

a substantially crystalline first layer comprising antimony doped tin oxide, the first layer having a thickness of about 1200 Å to about 2300 Å, and having a first surface and an opposite surface defined as a second surface of the first layer with crystal size within the first layer increasing in a direction from the first surface of the first layer toward the second surface of the first layer;

a substantially crystalline second layer deposited over the first layer, the second layer comprising fluorine doped tin oxide and having a thickness of about 3000 Å to about 3600 Å and having a first surface and an opposite surface defined as a second surface of the second layer with the first surface of the second layer in facing relationship to the second surface of the first layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer, [;] and

a breaker layer [located] between the first and second crystalline layers, the breaker layer configured to prevent or at least reduce epitaxial growth of crystals at the first surface of the second layer on the crystals at the second surface of the first layer.

18. (Twice Amended) A coated article, comprising:
a substrate; and
a coating deposited over at least a portion of the substrate, the coating comprising:

a first coating [surface] layer having crystallinity, and a first surface and an opposite surface defined as a second surface of the first coating layer with crystal size within the first coating layer increasing in a direction from the first surface of the first coating layer toward the second surface of the first coating layer;

a second coating [surface] layer having crystallinity, and a first surface and an opposite surface defined as a second surface of the second coating layer with the first surface of the second layer in facing relationship to the second surface of the first layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer,; and

at least one breaker layer [located] between the second surface of the first layer and the first surface of the second [coating surfaces and], the breaker layer configured to interrupt [a] crystal structure of the coating whereby the size of the crystals at the second surface of the first layer are larger than size of the crystals at the first surface of the second layer.

19. (Amended) The [coating] coated article according to claim 18, wherein [the first and second coating surfaces are substantially crystalline and] the breaker layer is substantially amorphous.

20. (Amended) The [coating] coated article according to claim 18, wherein the first coating [surface] layer comprises at least one metal oxide.

21. (Amended) The [coating] coated article according to claim 20, wherein the first coating [surface] layer further comprises at least one dopant.

22. (Twice Amended) The [coating] coated article according to claim 18, wherein the second [coating surface] layer comprises at least one metal oxide.

23. (Amended) The [coating] coated article according to claim 22, wherein the second [coating surface] layer further comprises at least one dopant.

24. (Amended) The [coating] coated article according to claim 18, wherein the breaker layer comprises at least one metal oxide and phosphorous.

25. (Amended) The [coating] coated article according to claim 18, wherein the breaker layer comprises at least one metal oxide and silicon.

26. (Amended) A coated article, comprising:

a substrate;

a substantially crystalline first layer deposited over at least a portion of the substrate, the first layer having a first surface and an opposite surface defined as a second surface of the first layer with crystal size within the first layer increasing in a direction from the first surface of the first layer toward the second surface of the first coating layer;

a breaker layer deposited over the second surface of the first layer;
and

a substantially crystalline second layer deposited over the breaker layer, the second layer having a first surface and an opposite surface defined as a second surface of the second layer with the first surface of the second layer in facing relationship to the second surface of the first layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer,

wherein the breaker layer is configured to inhibit epitaxial growth of the second crystalline layer on the first crystalline layer.

41. (Amended) A coated article, comprising:

a substrate;

a substantially crystalline [first] layer deposited over at least a portion of the substrate, the layer having a first surface and an opposite surface defined as a second surface of the layer with crystal size within the layer increasing in a direction from the first surface of the layer toward the second surface of the layer;
and

a breaker layer deposited over at least a portion of the second surface of the [first] layer, the breaker layer configured to prevent or at least reduce epitaxial growth from initiating on the second surface of the [of a subsequently deposited crystalline layer over the first] layer.

44. (Amended) The article as claimed in claim 42, including a second substantially transparent, conductive metal oxide layer deposited over the first conductive metal oxide layer, wherein the second conductive metal oxide layer has a thickness of about 0Å to about 3000Å, wherein the second conductive metal oxide layer is fluorine doped tin oxide, and wherein the thickness of the second layer is [inversely] proportional to the thickness of the first layer.

46.(Amended) A coated article, comprising:

a substrate;

a first doped metal oxide layer deposited over at least a portion of the substrate, the first doped metal oxide having an index of refraction; and

a second doped metal oxide layer deposited over the first doped metal oxide layer, the second doped layer having an index of refraction wherein the index of refraction of the first doped metal oxide layer [has a] is lower than the index of refraction [refractive index than that] of the second doped metal oxide layer.

49. (Amended) A coated article, comprising:

a substrate;

a color suppression layer deposited over at least a portion of the substrate;

a substantially crystalline first layer deposited over the color suppression layer, the first layer having a first surface and an opposite surface defined as a second surface of the first layer with crystal size within the first layer increasing in a direction from the first surface of the first layer toward the second surface of the first coating layer wherein the first surface of the first layer is over the color suppression layer;

a substantially crystalline second layer deposited over the first layer, the second layer having a first surface and an opposite surface defined as a second surface of the second layer with the first surface of the second layer in facing relationship to the second surface of the first layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer,[:] and

a breaker layer [located] between the first and second layers, the breaker layer configured to prevent or reduce epitaxial growth of the first surface of the second layer on the second surface of the first layer.

58. (Twice Amended) A coated article comprising:

a substrate;

a first coating region deposited over at least a portion of the substrate, the first coating region comprising a metal oxide and a first dopant, the first coating region having a first surface and an opposite surface defined as a second surface of the first coating region with crystal size within the first the first coating region increasing in a direction from the first surface of the first coating region toward the second surface of the first coating region wherein the first surface of the first coating region is over the substrate;

a transition region deposited over the first region, the transition region comprising a metal oxide, the first dopant, and a second dopant, with the ratio of the first dopant to the second dopant constantly changing as the [with] distance from the substrate changes wherein, the transition region has a first surface and an opposite surface defined as a second surface of the transition region with crystal size within

the transition region increasing in a direction from the first surface of the transition region toward the second surface of the transition region wherein the first surface of the transition region is over the second surface of the first coating region;

a second coating region deposited over the transition region, the second coating region comprising a metal oxide and the second dopant, the second coating region having a first surface and an opposite surface defined as a second surface of the second coating region with crystal size within the second coating region increasing in a direction from the first surface of the second coating region toward the second surface of the coating region wherein the first surface of the second coating region is over the second surface of the transition region,[:] and

at least one breaker layer located between at least [two of] one of the following groups to prevent or reduce epitaxial growth between the at least one of the following groups: (a) the second surface of the first region[,] and the first surface of the transition region, or (b) the second surface of the transition region and the first surface of the second region.

59. (Amended) A method of coating a substrate, comprising the steps of:

depositing a substantially crystalline first layer over at least a portion of a substrate, the first layer having a first surface and an opposite surface defined as a second surface of the first coating layer with the first surface of the first layer over the substrate and with crystal size within the first layer increasing in a direction from the first surface of the first layer toward the second surface of the first layer;

depositing a breaker layer over the second surface of the first layer;
and

depositing a substantially crystalline second layer over the breaker layer,

the second layer having a first surface and an opposite surface defined as a second surface of the second layer with the first surface of the second layer over the breaker layer and with crystal size within the second layer increasing in a direction from the first surface of the second layer toward the second surface of the second layer, wherein

the breaker layer is configured to prohibit or reduce epitaxial growth of the second crystalline layer on the first crystalline layer.

60. (Amended) A method of coating a substrate, comprising the steps of:

depositing a substantially crystalline [first] layer over at least a portion of a substrate, the layer having a first surface and an opposite surface defined as a second surface of the layer with crystal size within the layer increasing in a direction from the first surface of the layer toward the second surface of the layer.[:] and

depositing a breaker layer over the [first] second surface of the crystalline layer, wherein the breaker layer is configured to prevent or at least reduce epitaxial growth [of a subsequent crystalline layer onto the first crystalline] from initiating on the second surface of the first crystalline layer.

61. (Amended) A method of forming a coated article, comprising the steps of:

providing a substrate;

depositing a color suppression layer over at least a portion of the substrate, the color suppression layer having a thickness of about 50Å to about 3000Å;

depositing a first substantially transparent conductive metal oxide layer over the color suppression layer, the first conductive metal oxide layer comprising antimony doped tin oxide having a thickness of about 700Å to about 3000Å; and

depositing a second, substantially transparent, conductive metal oxide layer over the first conductive metal oxide layer, the second conductive metal oxide layer comprising fluorine doped oxide having a thickness of about 0Å to about 3000Å, with the thickness of the second layer being substantially [inversely] proportional to the thickness of the first layer.